



10-5-9 QUAD CHROMATIC PITCH GENERATOR DATA SHEET

DESCRIPTION

The 10-5-9 Quad Chromatic Pitch Generator is a single board audio pitch generator for musical applications. It is S-100 compatible, and will plug directly into any S-100 computer (MITS 8800, IMSAI 8080, etc.) with a 2 Mhz clock. This board is also available in a parallel output compatible version as part number 10-5-10.

The board consists of a control section, and four channel sections. The control section contains the S-100 address selection circuitry, and the top octave frequency generator. Each channel section is independant from any other channel section, and each channel section is identical in function. The board may contain the components for only one section, for two or three sections, or for all four channel sections.

Each channel produces a pitch which is selected programmatically from any of 96 frequencies which form an eight octave range. The entire standard piano range is included. The lowest frequency, an A natural, is about 27.5 Hz, and is the same note as the lowest note on a piano. The highest frequency, a G sharp, is about 6645 Hz. The top eight notes are higher than the highest note on a standard piano. Frequencies are derived from a single clock input which can be supplied externally or taken from the S-100 bus. Using a 2 MHz clock input, all notes are within 0.1% of the A=440 Hz frequency standard.

PROGRAMMING

The Pitch Generator is very simple to program. It takes four consecutive output addresses, the first of which must be divisible by four. The six most significant bits of the address are selected with a DIP switch on the board. The two least significant bits indicate which of the four channels is being output to. Programming is done with the OUT instruction. The most significant bit of the output (bit 7) is normally 1 and is set to 0 in order to play a "rest" (produce no tone). The next three bits (bits 6 through 4) indicate the octave number, 000 for the lowest frequencies to 111 for the highest. The remaining bits (3 through 0) indicate which note within the selected octave should be produced. 0000 is A, 0001 is A sharp, 0010 is B, 0011 is C, 0100 is C sharp, 0101 is D, 0110 is D sharp, 0111 is E, 1000 is F, 1001 is F sharp, 1010 is G, and 1011 is G sharp. 1100, 1101, 1110, and 1111 are not used. Since this output byte is related to the musical note (rather than to the frequency of the note), no look-up tables are required to convert a note to the proper frequency prior to output. This feature greatly simplifies programming the Pitch Generator. Once a channel is programmed by an output, it produces the indicated pitch until a new output is received. Note that each channel is essentially a separate device, and each has a different output port number. No "busy" loops are required since the Pitch Generator can process commands faster than an 8080 can output them, and is always ready to process a new output.

For those new to music, the owner's manual includes complete information on key signatures and reading sheet music. A song library is available to start you off until your own songs are programmed. The 8080 programs to play the songs, and the data for the songs, are available at reproduction costs.

APPLICATIONS

The Pitch Generator can be used alone to produce computer-controlled music with one to four notes played simultaneously. An on-board mixer provides an output for connection to any standard amplifier. Two boards can easily be connected to a stereo amplifier to provide eight channel capability.

In addition to mixing the tones as a complete music source, the Pitch Generator can be used as the basis for a synthesizer system. Many of the professional synthesizers used in studio recording start off with a pitch generator controlled by a keyboard or other controls. These signals are then put through various modules to modify the sound. The 10-5-9 was designed with this approach in mind. Each channel has its own frequency outputs (both TTL and 12 volt high-impedance) taken before the mixer which can be used with custom boards, future ALF accessories, or standard synthesizers. A master frequency input allows all four pitches to be modified in unison.

The A L F Pitch Generator is ideal for starting out in computer-controlled music. The four basic models (with one to four channels) allow a wide initial budget range, yet each unit can be easily expanded to the full capacity. The simple, straightforward design makes it easy to create accessories and ensures a wide variety of future accessories from A L F. The Pitch Generator will become a part of your computer synthesis system, completely expandable to eliminate obsolescence. In fact, the data format and output frequencies of the Pitch Generator are designed to be compatible with our top-of-the-line professional computer-controlled music synthesizer, the microprocessor controlled AD8.

So, while you can start with the Pitch Generator, you can expand as your needs grow. Despite the apparent simplicity of the Pitch Generator, its ability to produce music by itself is amazing. Perhaps you've seen an 8080 system play a simple song (with only one tone at a time) by turning an output bit on and off very rapidly, or with a radio set close by. Imagine what you can do using this same computer to control a device which is designed to produce music! Or, hear it yourself by ordering the demo record (see below).

The owner's manual is available separately for product evaluation. The product may later be ordered without the manual (and less the cost of the manual) by specifying option M.

OPTIONS

"A" options, specify one:

A1 with one channel*

A2 with two channels*

A3 with three channels*

A4 with four channels.

A5 one channel expander kit*

*Available in kit form only.

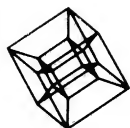
Additional options:

K kit form. Request the A L F Kit Policy Sheet. Tools required for assembly: small soldering iron, diagonal cutters, pliers for lead bending.

M less manual.

DEMONSTRATION RECORD

A standard 33 1/3 RPM record of the Pitch Generator is available. The price is \$1.00 which includes postage in the U.S. or Canada.



A L F Products Inc. 128 S. Taft; Lakewood, CO 80228

10-5-9 QUAD CHROMATIC PITCH GENERATOR PRICE LIST April 4, 1977

Order #*	Description	1-9	10 up
10-5-9(A1,K)	One channel, kit	\$111.00	\$79.00
10-5-9(A2,K)	Two channels, kit	\$127.00	\$90.50
10-5-9(A3,K)	Three channels, kit	\$143.00	\$102.00
10-5-9(A4,K)	Four channels, kit	\$159.00	\$113.50
10-5-9(A5,K)	One channel add-on, kit	\$16.00	\$11.50
10-5-9(A4)	Four channels, assembled	\$185.00	\$140.00
10-5-9(Manual)	Owner's Manual alone	\$3.00**	\$3.00**
10-5-9(Record)	Demonstration Record	\$1.00	\$1.00
Options:***	Description	1-9	10 up
M	Less owner's manual	-\$3.00	-\$3.00

*Option lists (given in parentheses) must be included in order number.

**Add \$1.00 for postage and handling

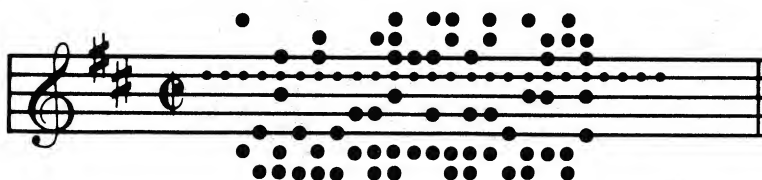
***Include option number within option list (in parentheses) to order.

Prices and specifications subject to change without notice.

Request the A L F Kit Policy Sheet prior to ordering kits.

Payments for all orders must be sent with order. No C.O.D.'s accepted. Purchase orders (net 30 days) will be accepted from U.S. government agencies, schools, universities, and firms sending acceptable proof of credit. Payment must be in U.S. currency. We will wait for checks to clear (except cashier's checks and certified checks) before sending order.

Orders outside the U.S. must add any appropriate charges such as any additional shipping costs, tariffs, etc.



Computer-Controlled Music